

Main Currents

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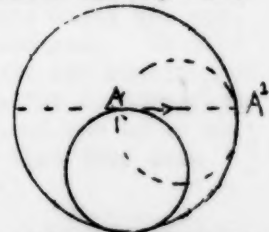
ON THE NATURE OF THE CRISIS

Editorial Note

It is a matter of common observation that obvious principles of far-reaching importance are not invariably pursued in contemporary studies, even though acceptance of them might lead to profound understanding of Nature and of man. The case most in mind at the present moment is cyclism -- cycles in Nature as a principle as universal as gravity. Obviously this is a general natural rule, and in many departments of science rotation, repeating curves, cycles and the like are studied every day. But this is quite different from the admission of a general principle associated not only with all matter but with living creatures and even human affairs. The physicist cannot doubt the law as regards matter, from electrons spinning on axes, in orbits, right up through earth movements to spinning island universes. The biologist admits the law everywhere good in his domain, from cell upward, though the spin is now not spatial but temporal. People of relatively simple minds would suppose that when there is a phenomenon as universal as this in two great departments of thought, at least some suspicion and interest would be roused as to its complete universality; as to its governing history, for example. But the European literature of the latter subject shows almost no serious concern with cyclism in history, Oswald Spengler and J. J. van der Leeuw almost alone having done any adequate work on the subject. To be sure there have been sporadic attempts made, here and there, to discover relationship between sun-spot cycles and disturbances in human affairs, but we are a long way away from the assumption of the ancients that it is a general rule. Does this deny to us a real and wonderful instrument for better understanding?

If this is true, if this is a real lack, it may not go much longer unrecognized. For after all, the properties of space-time are now known to be what really govern motion; and since space-time is universally conceded at present to be either spherical or elliptical (the two forms of Riemannian space as broken down by Felix Klein) we cannot really be so far away from the discovery that the thousands of instances of cyclism in physics are functions of this background. From such discovery to a similar admission as regards growth and life is but a short step, since growth cycles are in time, which is a portion of the space-time manifold. Humanity's obedience to the cycles should thereafter be easy to establish -- if true.

To those who do not profoundly doubt enduring value in philosophical achievements of antiquity, the universality of cyclism has long been acceptable as a concept. As a matter of fact, in some passages in Plato, for instance, are clues of highest worth with which many problems in modern thought could probably be advanced toward solution. One example is in the Timaeus, when Plato links what we would call spherical space with Euclidian space by describing what we today call White's motion. I have not seen reference to this small but important fact anywhere in recent literature, where a great deal is written about whether space is Euclidian or Riemannian and so on, as if Nature had to choose because we are ignorant. The truth is that Euclidian space is a function of Spherical space, provided cyclism is assumed. For the reader who may have lost sight of the fact, we supply the necessary diagram. In these two circles the point A on the circumference of the smaller rolling one falls on the center of the larger fixed one. As the smaller rolls along on the inner edge of the larger, so to speak, the point A moves in the path shown by the dotted straight line, to A¹.



Thus, provided cyclism is a basic property of absolute motion, Euclidian geometry is as universal as Spherical. The foregoing is a simple and exact re-statement of Plato's remarks about the universe being a circular animal; that is, constructed upon spherical space principles, but quivering with life. If cyclism rules matter, creatures and man, then we would do well to ask ourselves whether the importance of it in regard to the global crisis of today can be overestimated. Are we not just about at the bottom of various epochs, all coming together in one stupendous abyss, preparatory to rising and carrying man into a new age? We have also to ask ourselves whether the sad spectacle of events connected with Eastern and Western Man (with Russia between) does not mark a stupendous shift in ways of living. Either the western peoples are going to try to return to the Orient as conquerors, profiteers, capitalists, transferring their own internal problems of mass production to foreign fields in order to escape solving them with brotherhood at home -- or else the western peoples are going to deal decently and fairly with the people of China and India in particular, and all others as well. We have not done the latter; and we have not yet said how we will. This is why we are still losing ground -- and the scene makes one heartsick!

In this country the momentum of capitalist imperialism is scarcely checked. The newspapers, the magazines, even the books appearing -- do they really come to grips with the situation? In England the brave, dogged, admirable common man and woman is heroic in the face of misery and gloom we are incapable of conceiving, but are there any signs there in the words or deeds of men like the Secretary of State for India, that England means to help a new world come into existence by acts?

The answer to these questions is a sad, an unquestionable negative. Is this then the end of an epoch and the opening of a new age? It is a question of great interest, not to be answered in terms of simple opinion. Many persons in recent decades have mistaken normal transitions, from one generation to the next, to be just such crises. The error is natural. It is easy to project one's own small feelings of the eternal flux upon the passing scene. A man left the patent office in Washington late in the last century, to be free to develop and protect certain inventions of his own. He was convinced that nearly everything of mechanical importance had been discovered, so it behooved him to get his items in before the era of invention came to an end.

Since his day many thousands patents have been issued by that office alone, and the age of invention seems to be only now really getting under way. Nevertheless historical epochs do close, and new ones do open. And there are some acceptable standards by which past transitions can be measured and present eras of change therefore determined, especially the larger transitions which run courses of centuries, even to two or three millenia. If the contemporary scene be tested on such terms, do we see many component forces of history, crowding through narrow passes and over true crests, compelling us to admit that a world crisis ending a great cycle, no less, is the event we witness?

The question is certainly well worth asking. And while we are on guard against mistakes of the over-credulous, we do well surely also to be aware of the opposite error, an exaggerated modesty which makes some people suppose that no great crisis would occur while they, so unimportant, are there to observe. They feel, no doubt rightly, that no less personages than Aknatoons, Caesars, Akbars and Elizabeths must be on hand. History must later decide of course whether we have among us, now, the required great persons as pivots for commensurately great changes. However that may be, it is quite sure that a number of very ordinary folk are required to hang about on such occasions. And surely we ordinary folk are not so completely commonplace as actually to prevent a crisis proceeding? Someone has to be on hand to make up the mob scenes. And "the ancients never knew that they were ancients."

If we turn from simple opinion and look for impersonal standards, three bases for judgment appear. It is reasonable to suppose that a world crisis, a millennial situation, will mark the synchrony of many large and small elements -- greater and lesser waves, all entering simultaneously on the same change of phase; great and small factors alike must also have some features in common; and finally, the era of transition or change of direction of the curve must display an opposite character or quality from that of the crest which went before.

All three standards by which to judge this a world crisis apply to our times, but we may concentrate on what might be said to be the main characteristic of this age of confusion in which we live, and upon its opposite feature, the crest of the wave that is past. It is easy to show this is the death of materialism, because the sciences most concerned with matter have worked their way right through to something which is quite non-material, to a matrix which embraces matter and even brings it into being. And of what was this now passing crass materialism a natural reaction? Obviously the equally thorough-going, uncritical religious faith of a previous time. For such an uncritical zeal is the natural opposite of an over-critical intellectualism. Neither is completely intelligent, and therefore neither endures. Hence oscillation, cyclism.

What originally brought into existence this great swing from an other-worldly spiritual aspiration, which rose up in the ethereal Gothic spire, to a gross worldly materialism that sank down into a pit at Fort Knox, where is buried a large part of the nation's gold and its ideals and its hopes? So stark is the scene in the lurid light of today that one answer to all these points is clear. The earlier cause lies in the isolation of Europe from the world-context. This gave rise to both extremes, and if we look merely at the last century as a specimen lesser cycle, a wild acceleration of the more ponderous swing of several centuries, that much will be evident.

The year 1947 is the centenary of The Origin of Species, and of the Communist Manifesto. However necessary in the development of Europe, both are opposites of spiritual concepts. In Darwin's treatment of evolution the final authority over life's course rested with the material environment. In Marx, human motives are fastened down in the end to conflict over material resources.

We must not allow ourselves to be distracted, by the behavior of any people who prize these prophets, from the patent fact that they focussed forces of history in their writings. We might suppose, in observing the thoughtfulness, politeness and doggedness in individual British and Russian people, that Darwin and Marx, who imply competition and struggle, have really had little effect on the lives of these, their followers. When we cast up the accounts of European nations as nations however, we begin to suspect that something or other, connected somehow or other with Marx and Darwin, has been going on.

The truth of course is that materialistic writers of the mid- and later nineteenth century simply revealed certain forces coming to full effect after a grand historical movement which may be summarised once more in the phrase, the isolation of Europe from the world-context. Marx and Darwin, in short, are late by-products of the very same process which provides the world-crisis as an end product. In history, as in many animal organisms, by-products are often catalytics which continue to accelerate the main process. In the case of human history this consists in transferring to the conscious sphere whatever is needed therein to make sure that man's deliberate deeds shall, in the long run, fit into the whole. Darwin and Marx are a species of green and red traffic light. They influence, they do not make traffic. Signals warn motorists of conditions which exist or are developing, but signals do not mine steel, drill oil wells, make cars and gasoline, fill tanks, build runs, develop cities and streets and give birth to babies who grow up

to sit in the seat of power in automobiles. It has indeed been well said that even the driver, who seems so effective, so much a true cause -- he for whom all this has happened -- is only that part of the automobile which is merely the cause of most accidents; that odd and generally loose nut behind the steering wheel.

Prophets then only help to make history, itself a vast complex going on, and in that going-on man, perhaps all but a millionth part unconscious, participates. Even his small capacity to witness the going-on is not power to control events. Marx and Darwin were symptoms of one and the same disease, a European affliction which they helped to accelerate and which has now run its course. The century which ends in 1947 is the last fevered hour of the patient's crisis; and the final moment which is to end Europe's isolation from the world-context coincides quite naturally with the inevitable end of gross materialism.

That isolation, which was to result in the development of what is now Western Man, was already proceeding a century before Muhammad was born (about 570-632 A. D. Muhammad flourished) dating conveniently about the time of the fall of the Roman Empire of the West, in 476. The establishment of Islam in the sixth and seventh centuries in the Eastern Mediterranean only enforced geographically that which in any case had been proceeding as Christianity became more and more successful in Europe. The Crusades presently confirmed by conflict in the Levant, a final separation of the continent as a whole from the rest of mankind. When the Dark Ages ended only faint flutters, damped down by the Urals and the Caucasus, were reaching Europe from the strong pulse of life among Asian peoples. Only small cargoes of spices and other bales of rare goods filtered through the Near East to convey fragrances from what had become a nearly fabulous world. A belt of Arabs and Moors encircled Southern Europe and shut it off from most of Africa. The Atlantic was an unchallenged abyss on the West. Thus for centuries proceeded that first conditioning into the vanity of separateness of those people, the Europeans, who were destined presently to release upon the world the forces whose fearful outworkings we see today.

Rediscovery of the philosophies of Attic antiquity did nothing substantial to arrest in European man the effects of this isolation. If Plato had become The Philosopher when classical culture was recovered in part, the course of development might conceivably have changed somewhat toward world-union, since Plato was the last of the great thinkers who lived in times when an underlying world unity through common concepts still persisted. But not even that chance fell favorably. Instead, Aristotle became The Philosopher. Thus the basis for European materialism was laid in Aristotle's idea of a primordial mud, and when the special feature of European culture, science, in due time took shape it was inevitable that this mud should become the hard and spiritually sterile clay of materialism. So natural has this materialism been to us until quite lately that we have still to conceive of a science that is as valid for life and consciousness as it is for matter or energy.

In due time the period of geographical isolation drew to a close. In dramatic voyages knowledge not only of Asia but of the New World came back to Europe. The resumption of relations arrived however too late to re-shape minds. The genius of Roger Bacon had set Europe toward observational science right within the walls of monasteries, going on as Columbus brought news of the Americas. Francis Bacon was organising thought to fit objective research even as Elizabethans struggled for that supremacy on the far seas which in due time Britain achieved. When then at last Darwin and Disraeli and Marx and Maxwell and others released into the world those ideas which have so powerfully sanctioned competition, power politics, materialistic economics and techniques of energetics sciences -- leading eventually to mass production and mass murder -- the cycle of an era had reached nearly full round.

Surely what we witness today then, is indeed the close of an epoch and the opening of a new one. European man has come to the end of his isolation. Industrial Japan is Western Man's own invention recoiling hideously, grotesquely upon him. We begin to see that the salvation and solidarity of mankind cannot come from military conquest, though defense at arms is necessary. Machines will not become moral and cultural just by themselves. Therefore a new synthesis is imperative. The hope of the world is the reunion of mankind upon a basis which salvages the real gains and values in science -- in Europeanism, shall we say ? -- but ends the evils of the centuries of isolation and subsequent arrogance. A better world is to be sought in those superior ideas which will eventually appear to embrace, in one natural whole, both the values of Plato and his intellectual forbears -- including the genius of the East -- and also the special developments of knowledge which Europeanism has brought about.

Quite recent developments in science itself have made this rapprochement possible. In the very midst of the turmoil and under the very clangor attending the last dying years of that epoch that is closing, the special genius of Europe made those crucial and necessary discoveries which validate, in effect, the concepts of the older philosophies. Therefore nothing today prevents the intellectual reunion of mankind being brought off as a necessary preliminary to the economic and political union of the nations, which also impends. Nothing prevents an integration of knowledge, the devising of an educational attitude (and even a curriculum) so central to all cultured minds that that union of the world can be strengthened by universal education about laws of nature in a framework of valid and acceptable philosophy which impels to a reasonable norm of good conduct. Such education alone will make such union endure. Science, which the isolation and suffering of Europe brought into being as its gift to mankind, can be a true medium for all of this. F. K.

GAUTAMA BUDDHA ON WAR

Extract

[The following passage is quoted by us from the Bulletin of The Peace Lodge, Hyde, Cheshire, England. Unfortunately we are unable to trace as yet the source in the Pitakas, or Buddhist Canon, whence this is quoted. Simha is a common appellation for military men of the kshattriya caste, meaning "Lion". Editor, MAIN CURRENTS]

A certain general by the name of Simha sought the company of the great sage that he might settle some of his own deep ponderings.

"I am a general, O Blessed One," said Simha, "and am appointed by the King to enforce his laws and to wage his wars. Does the Tathagata (i.e. "The Perfect One") who teaches kindness without end and compassion with all sufferers, permit the punishment of the criminal ? And further, does the Tathagata declare that it is wrong to go to war for the protection of our homes, our wives, our children, and our property ? Does the Tathagata teach the doctrine of complete self-surrender, so that I should suffer the evil-doer to do what he pleases and yield submissively to him who threatens to take by violence what is my own ? Does the Tathagata maintain that all strife, including such warfare as is waged for a righteous cause, should be forbidden ?"

The Buddha replied: "He who deserves punishment must be punished, and he who is worthy of favour must be favoured. Yet at the same time the Tathagata teaches to do no injury to any living being but to be full of love and kindness. These injunctions are not contradictory, for whoever must be punished for the crimes which he has committed suffers his injury not through the ill-will of the judge but on account of his evil-doing. His own acts have brought upon him the injury

that the executor of the law inflicts. When a magistrate punishes, let him not harbour hatred in his breast; yet a murderer, when put to death, should consider that this is the fruit of his own act. As soon as he will understand that the punishment will purify his soul, he will no longer lament his fate but rejoice at it."

And the Blessed One continued: "The Tathagata teaches that all warfare in which man tries to slay his brother is lamentable, but he does not teach that those who go to war in a righteous cause after having exhausted all means to preserve the peace are blame-worthy. He must be blamed who is the cause of war. The Tathagata teaches a complete surrender of self, but he does not teach a surrender of anything to those powers that are evil, be they men or gods or the elements of nature. Struggle must be, for all life is a struggle of some kind. But he that struggles should look to it lest he struggle in the interest of self against truth and righteousness."

"He who struggles in the interest of self, so that he may be great or powerful or rich or famous, will have no reward; but he who struggles for righteousness and truth, will have a great reward, for even his defeat will be a victory. Self is not a fit vessel to receive any great success; self is small and brittle and its contents will soon be spilt for the benefit, and perhaps also for the curse, of others. Truth, however, is large enough to receive the yearnings and aspirations of all selves and when the selves break like soap-bubbles, their contents will be preserved and in the truth they will lead a life everlasting."

"He who goes to battle, O Simha, even though it be in a righteous cause must be prepared to be slain by his enemies, for that is the destiny of warriors; and should his fate overtake him he has no reason for complaint. But he who is victorious should remember the instability of earthly things. His success may be great, but be it ever so great the wheel of fortune may turn again and bring him down into the dust. However, if he moderates himself and, extinguishing all hatred in his heart, lifts his down-trodden adversary up and says to him, 'Come now and make peace and let us be brothers,' he will gain a victory that is not a transient success, for its fruits will remain forever."

"Great is the successful general, O Simha, but he who has conquered self is the greater victor. The doctrine of the conquest of self, O Simha, is not taught to destroy the souls of men, but to preserve them. He who has conquered self is more fit to live, to be successful, and to gain victories than he who is the slave of self. He whose mind is free from the illusion of self, will stand and not fall in the battle of life. He whose intentions are righteousness and justice, will meet with no failure, but be successful in his enterprises and his success will endure. He who harbours in his heart love of truth will live and not die, for he has drunk the water of immortality. Struggle then, O general, courageously; and fight thy battles vigorously but be a soldier of truth and the Tathagat will bless thee."

CATALYTICS IN SOCIAL HISTORY

Conscious Acceleration and Direction

In the leading article above the suggestion is made that history is a vast complex of Nature and Man, in which a certain interaction occurs, leading to acceleration and re-direction of the course, each time great ideas arise in the conscious and get published. Reference is made to such works as The Communist Manifesto and The Origin of Species in 1847. The latter work actually appeared in 1859, but 1847 is all the same the correct date for the crucial event. For there is a singular episode connected with the European development of the idea of evolution. Darwin had written, after his return from the voyage of the Beagle, a resume of his ideas, which between 1837 and 1844 were enlarged. In 1844 appeared a strange

anonymous work, Vestiges of Creation, which was to run through ten editions. Apparently Darwin was prompted by this to show his own sketch to Sir C. Lyell and Dr. Hooker, and the whole issue of evolution was thus joined at the time of the appearance of the Manifesto.

There are many other extraordinary instances of sudden crystallization of great concepts into conscious and available form. In 1847 in the area as remote as mathematics was then from biology and from sociology---for of course mathematics today is invading both fields with extraordinary rapidity---there were intellectual forces coming to play. In 1847 Boole published The Mathematical Analysis of Logic. In 1847 the brilliant G. F. B. Riemann was giving a crucial turn to the then new geometries of Gauss, Bolyai and Lobachevsky. In 1843 Sir William Rowan-Hamilton formulated Quaternions, in 1847 Lionville transcendental numbers, and so on.

The whole question of historical process, as a going-on as systematic as natural order in biology, really wants exploration. Social forces are not at all what they seem. Again in the foregoing passage reference is made to Roger Bacon. Here is a man, living between 1214 and 1294, who seems to have discovered the microscope and the telescope, who wrote of his advanced discoveries in a cipher (unlocked by Professor William Newbold), but generally functioned as a catalytic right within the walls of monasteries. He became a subject of ballad, a magician to the populace. What are we to make of such an episode? What kind of talent was at work in a man who under these limiting circumstances could say: "The end of all true philosophy is to arrive at a knowledge of the creation through knowledge of the external world," who could declare that mathematics is the gate and key to science?

The properties of time-space in relation to social forces is just as valid a study as the relation of time-space to any other aspect of Nature is valid. History need no longer be just an account of what happened, with small references to economic, literary and other "forces" at work. Truly, if we sought for patterns and cycles in the social going-on, we could explain philosophically why Europe (by what we call chance) was denied knowledge of zero, which Hindus and Mayans had---a lack which stultified thought in Europe until the mire of materialism could begin to close round the continent. Clearly however, nothing less than what Dr. H. M. Kallen calls orchestration -- the union of all the wealth of the great cultural discipline into one harmonic whole -- will create a social science in the true sense of that word. I. N.

The creation of a new individual takes place when an egg cell is invaded by a sperm cell, thousands of times smaller. Each cell contains a couple of dozen chromosomes, which are strings of genes, tiny chemical packets, molecules of all heritable life. There is no evidence that these genes vary from generation to generation, except for sudden occasional seemingly spontaneous changes called "mutations." This suggests that popular ways of thinking on heredity are wrong, because nothing occurring in an individual's life can change the genes of his or her body, not even health nor any acquired disease.

In each new individual the genes appear in a combination which by laws of chance could never happen twice. From any two parents, where two germs must combine, the chance of any given result will be once in 281,474,976,710,656 times, subject to slight correction. So the different types of offspring possible from any two parents must run at least, into billions. These facts, which have been established beyond reasonable doubt, play hob with our habitual notions of inheritance and of "good stocks". They do not throw us back to notions of an equality of endowment, but they do show that "good stock" in human kind may spring from almost anything.

Plants and animals can be bred for certain specified traits, but without inbreeding among families, little change in human stocks can be made by breeding, sterilization or other efforts to guide nature. The gifted individual testifies only that his parents together must have held a number of good genes. We usually assume that the majority of superior children will spring from superior parents. This is probably wrong, for from any pair of gifted parents no single type is born but rather a vast variety is produced. The best possible gene combinations from better parents will be better than the best possible combinations from inferior parents. However, the number of inferior or average quality parents always exceeds vastly the number of exceptionally superior or exceptionally inferior. Because of this numerical difference the chance of a genius being born from average or mediocre parents must at all times be greater than the chance of a genius being born from superior parents.

The brilliant children of ordinary parents are never as dominant as theory might imply. This is because the battle for success is infinitely more difficult than that of children with better economic background. Here environment scores heavily. As geneticists see it, potential ability is scattered thru all strata of society. All humanity is of one stock and the stock is a hardy one. There is no scientific evidence that any one race or color is less able than any other, or that it is barred by anything in its genes from the utmost in accomplishment. These are the conclusions of Bertram F. Wilcox in "Common Sense" - July, 1941. (Science Digest 12, 79-91, August, 1942. A. J. P.)

NATURE'S COUNTERPOINT

Chemical Equilibrium

Gonadotropstetic, thyrotrophic, prolactin, corticosterone, deibetogenic and other anti-hormones are known. They inactivate in vivo the corresponding hormones. As the name indicates they are more like antibodies than like chalones. In the times of their appearance and disappearance in relation to a course of hormone injections they resemble antibodies. They are produced only when the reticuloendothelial system is functioning. They are not entirely species specific but the deviations have precedents in immunology. The hormone preparations which cause the production of antihormones are either heterologous or relatively impure, the hormone can be separated from the carrier substance, which is antigenic while the hormone radical is not. Although there exist data indicating that the hormonal portion of the antigen is a haptene, yet at present this cannot be assured; the various hormones

may differ in this respect. The presence of antihormones in the sera of untreated animals has been reported. In certain instances of injecting gonadotrophic hormone the serum has developed power augmenting, instead of opposing, the action of the hormone. Possibly the fact that an animal injected repeatedly with heterologous or ill-purified hormones develops antihormones and so becomes refractory to the effects of its own hormone as well as to the injections, may be turned by investigators to a useful purpose in cases of endocrine hyperfunction. (Margaret Sumwalt in Biol. Absts. mention of Kenneth Wade Thompson's "Antihormones" from Physiol. Rev. 21 (4) 588-631).

EMOTION AND ALLERGY

What, then, to Inject ?

- Briefly reported data on 3 patients analyzed by Dr. Saul showed that a factor in their symptoms of hay fever was repressed libidinal desire. Twenty-seven (27) psycho-analyzed patients showed a close attachment and dependence upon the mother. If this relationship was suddenly threatened, an asthmatic attack regularly occurred. The author proposes the general theory that "intense, unsatisfied longing for love affects the individual's allergic sensitivity." The love is of the infantile kind such as of the child for its mother. If the longing becomes especially severe, allergic sensitivity is increased and the symptoms appear. (William Galt in Biol. Absts. mention of Leon J. Saul's "Some observations on the relations of emotions and allergy." Psychosom. Med. 3(1):66-71. 1941).

SUBTERRANEAN WATER AND THE DIVINING ROD

[When there came to MAIN CURRENTS from someone a newspaper clipping giving the story of the occurrence retailed below, we asked Mr. Don Pratt, manager of the airport in question, to give us the authentic account. Here is his letter in response to our request.]

Municipal Airport
Hays, Kansas
August 7, 1942

Editor, Main Currents in Modern Thought:

Replying to your kind letter of August 3rd, I shall give you a description of the experience we had in locating a water well here at the Municipal Airport. About 10 years ago the city bought the tract of land where we are now operating our flying school, and attempted to locate a water well. They drilled several test holes unsuccessfully and finally installed a cistern which has been for the past ten years the only available source, water having to be hauled from town.

On August of 1941 we drilled and tried to locate a well on some land recently purchased by the city adjacent to the Airport, which is now part of the Airport itself. We had a rotary power rig and made twelve attempts to locate water on various locations that seemed likely places. The young man that I had in charge of the drilling apparatus asked if he would be permitted to have Mr. Groff come out and try and locate a well of water with his forked stick. Contrary to the description noted in the story of the newspaper, the forked stick did not "begin jumping" in his hands, but after a period of an hour he located what he claimed was a vein of water, just barely touching the edge of the land recently purchased by the city.

I was, of course, very skeptical but told the young man in charge of the drilling to go ahead. This was in October of last year. After drilling to a depth of approximately 50 feet we discovered water. Letting the test hole set for four

days as recommended we still had in this 50 foot hole 23 feet of water. At this time the weather began to get too bad, the ground froze, and we were unable to complete the well by hand which we did several months ago. After enlarging the test hole to a six inch diameter we discovered we still had approximately 23 feet of water in a well 46 feet deep to the blue shale or bottom of the hole.

We have attempted to pump this dry with a small pressure pump, capacity 600 gallons per hour but were unable to do this. It is without a doubt vein water and a very good well. Needless to say I was as skeptical as you are on this matter, and though there is no scientific basis to my knowledge for the location of water, the fact remains that we do have a well within approximately 75 feet of where we had just drilled a dry hole with absolutely no trace of water.

Don Pratt - P-T Air Service, Inc.

MECHANICAL INFLUENCES UPON TANNING

And Arterial Aging

The aldehyde content in human blood is so high that in the light of experience with industrial protein gels, it should amply suffice to tan the body proteins to complete rigidity and loss of elasticity within a matter of months. However from experiments carried out in the laboratory of Ditto, Inc., Johan Bjorksten and William J. Champion have shown that glycerin gelatin sheets tanned with an acetaldehyde solution, when stretched and relaxed at a rate of eight times a minute, increased in strength several times over that of unstretched sheets. Tanning took place but not in a manner to impair strength.

This condition of repeated stretching and relaxing is present in the walls of the arteries of higher animals and it is concluded that the effect noted may be of considerable importance in delaying the aging of arteries and may explain the slow process of this aging in spite of the presence of active tanning agents in the blood. The beneficial effects of exercise and the atrophy of organs under continued absence of stretch may also be involved in this effect. (Jour. Am. Chem. Soc. 64; 868-9, April, 1942).

On the other hands, Drs. Michael Lake, Gerald H. Pratt and Irving S. Wright of New York find that hardening of the arteries of the legs as a result of occupational stress and strain develops earlier in men who climb stairs than in men who do not. Over the age of 50, there was no significant difference in the amount of artery disease in standing, sitting or walking men. (Science News Letter 42; July 4, 1942. A. J. P.)

MENTAL MECHANISM

A Test of Prisoners

The "brain waves" of 339 inmates of a state prison were studied with the electroencephalograph, by Drs. Frederick A. Gibbs, Wilfred Bloomberg and B. K. Bagchi of Boston. They found a total of 30% showing abnormal records, twice the incidence recorded in normal persons but only a third of the rate among epileptics. Thieves presented the highest figure, 40% abnormal, with habitual criminals registering 36%, sex criminals 34% and murderers 31%. "Strangely enough, there was only a 19% incidence among men whose crimes were characterized by unnecessary violence." (Science Digest 12;91 August 1942. A. J. P.)

PHYSIQUE IN THE WEST

The analysis of age, height and weight records of 32,000 Yale freshmen of the years 1883-1941 reveals that average age has decreased from 18.9 to 18.44 years; average weight has increased from 135.47 to 150.09 pounds; average height from 67.74 to 69.83 inches; and the percentage of men over 6 feet from 4.5 to 19.8. For the 59 year period the height range is 54.7 inches to 80.7 inches; and the weight range from 75 pounds to 265 pounds. - Eleanor Metheny.

(Wm. Dugan. A fifty nine year survey at Yale. Rev. Quart. Amer. Assoc. Health, Phys. Edu. & Recreation, 12(4) 707-711. 1942.)

PHYSIQUE IN THE EAST

Data were collected about the physical development of 1500 Punjabi boys of school and college age, from all communities. Their various body measurements were compared with those of other Indian and European groups. The differences in weight and height development, in chest diameter and circumference etc. between the group under study and Bengal, Kahmir and European children are small, while Assamese children are distinctly below the standard of others. The time of periods of rapid growth shows characteristic differences for all groups. Some illustration has been afforded to the theory that, while differences at birth are inconsiderable in different races, it is after puberty that differentiation takes place. The later sexual maturity occurs, the greater the final stature attained. From the figures collected certain biometrical proportions were calculated. The merits of certain indices on record are discussed and the Rohrer index, i. e. cubic root of weight over length, to the group under study, applied. Finally height and weight increment rates were compared and here, as in the previous comparative studies, differences of anthropometric interest were discovered.

(W. Fabisch and H. J. Hamburger Observations on the physical development of Punjabi boys. Indian Jour. Med. Res. 29 (3): 613-626. 6 fig. 1941.)

Here is another book that tells the life story of an anthropoid, a member of the family of the author, from her capture in French Equatorial Africa as a 9 lb. babe, up to her 9th year and weight of 438 pounds. It is an intimate account by an untrained but sympathetic observer of the affections, emotions, jealousies, intelligence and sly tricks of a gorilla brought up in a human family. She is remarkably affectionate even to her favorite kitten, but has her antipathies especially to photographers. She has no self-discipline but is cleanly in her habits. For a few days at the time of the new moon she is sensitive and unruly. She shows an instinctive fear of snakes. She loves to hear watches tick but exhibits nothing that indicates she has a sense of time. The book portrays an ape remarkably human in capacity to learn, in range of emotions, in affection, memory, cupidity, and momentary planning, but hardly in ratiocination at the human level. Readers of Toto's story cannot escape the conviction that the apes have remarkable affinities to man. (C. A. Kofoed in Bio. Absts. A. Maria Hoyt's, "Toto and I. A gorilla in the Family." (Intro. by Roger Conant xxv - 238 R Frontis., map. 35 fig. J. B. Lippincott, Phil. 1941. Price \$2.50.)

The items which follow constitute another little cluster of points which show how single atoms in very large bio-molecules change the properties of that molecule how single atoms of metals in organic molecules and minute quantities of metals in food sources change whole situations for and in organisms, how very different are the protoplasmic contents of animals and plants, how environment and creature will never be understood except as one whole---in short, the old theme of the fine-world and the superphysical or ideal world presents itself, the old question of purpose in life. (An odd little appendage to the group is provided from Mexico, the suggestion that the volcanoes, fumaroles, geysers, mudpots and the like are today producing life from simple chemical sources. There is no mention in this paragraph of such new organisms actually being found, but we print the item as a contrast to the rest).

This old theme is on the verge of a good resolution at last. As the number of instances where one-atom substitutions make changes such as are seen in chlorophyll, haemocyanin and haemoglobin---magnesium to copper to iron---and these changes are associated with modes of life as different as sequoia, marine shell fish, mammals like man, we get more and more evidence that ideal geometry is at work. For what we might call point-control of organisms by means of ideal goings-on behind the scene of the body and the environment gets more and more rational as matter gets more and more insubstantial, and single atoms get more and more significant biologically. That is, the idealism of Relativity is ready at hand for enlargement over the biological domain, as that domain shows more and more properties dependent upon fine-world changes. This same theme, biology, atoms, fine-world control, idealism of the modern realistic sort, was referred to in our June issue, 1942, p. 10: "There may be processes of growth where one atom not in a hundred but in five of fifty thousand makes a vast difference in ways beyond detection." The same theme is bound to come up over and over. The metals in particular seem to be involved in this business. It is well known that the metallic elements best of all display the basic properties and life. More and more, in short, mathematical treatment of the biosphere becomes possible. When that treatment is taken up seriously by some school of research free to embark upon it, we can expect rapid strides in the direction of unifying concepts. F. K.

CHEMICAL RESOURCES OF THE OCEAN

The Great Reservoir

In the official publication of the American Institute of Chemists, Harden F. Taylor, President of the Atlantic Coast Fisheries Co., points out how all the reagents of the world are being dumped into the sea, by nature, assisted by man, and how man, assisted by nature, is recovering some of these products.

The land is robbed of its chemical wealth in two ways and either way the ocean gets all. Natural processes involving the solution of solubles from the soil by rain which carries the solubles to the sea, there being a cycle with water evaporating, precipitating and dissolving more soluble material. Lightning produces nitric acid to aid in this process and even carbon dioxide dissolves limestone. Freezing and expanding water, wind and glaciers assist in this removal of land into the sea. Man likewise digs out ores which are processed and eventually the metal reach the junk pile there to rust and be dissolved. Coal and oil are burned, the ashes going into the air as well as into solution. One cubic mile of sea water contains 128 million tons of sodium chloride, 18 million tons of magnesium chloride, 358,000 tons of magnesium bromide, 1400 tons of fluorine etc., in solution. Through the ages the sediment oxides, phosphates, carbonates, silicates with skulls and skeletons of animals have settled to the bottom of the ocean, in places hundreds or thousands of feet in depth.

On the recovery side, sea weed abstracts iodine from seawater, the blood of certain marine shell fish contains as oxygen carrying pigment, a copper compound-haemocyanin instead of hemoglobin, the oxygen carrier of mammals. (These are the same as chlorophyll A, in which one atom of magnesium has the place of an atom of copper in haemocyanin, of iron in haemoglobin. The make up of the molecule is $C_{55}H_{70}O_6N_4$ Mg. -- Editor, Main Currents). Oysters growing near copper sheathed wrecks, accumulate high concentrations of copper. Other marine animals have a similar affinity for arsenic. A mollusc of the south Atlantic coast employs a manganese compound as its oxygen carrier while vanadium serves in the sea-anemones, sea-cucumbers and sea-squirts. A microscopic creature in sea water has as its skeleton not lime or silica but strontia.

In addition man has regained wealth from the ocean in magnesium for air-planes, bromine and iodine from sea water and the development and exploitation of vitamins, particularly A, whose only important sources is in fish liver oils. (The Chemist 19,96-101, April, 1942. A. J. P.)

PLANT AND ANIMAL PROTEINS

More Basic Differences

Before the Am. Assn. of Cereal Chemists, Prof. R. G. Gortner of the Univ. of Minn., pointed out that in the early days of food analysis chemists thought that plant and animal substances of any general class, were identical. Research has shown however, that the two classes are distinct and that there are many kinds of plant proteins. Even special proteins, hitherto considered uniform, simple substances, have within themselves further structural differentiations. These differences, though apparently insignificant, have far reaching effects both in food processing techniques and in nutritional values of the products. (Science Supplement 96,14, July 3, 1942. A. J. P.)

CHEMICAL ELEMENTS NEEDED FOR PLANTS

More on Significance of Metals

Healthy plants like good steel, need the addition of minute amounts of a number of chemical elements. Some of them are the same as those required for modern steel making, including manganese, molybdenum and copper. The story of these "micro-nutrients" was the subject of an address by Prof. D. R. Hoagland of the Univ. of Calif. before the Am. Assn. Ad. Science. Only a few parts in a million of soil solution are needed to maintain plant health, yet without this the plant sickens and dies. Fruit trees in soils without zinc, for example produce symptoms known as "little leaf" and "mottle leaf". Some of the micro elements in plants are of as great physiological importance indirectly to animal life as they are directly to the life of plants. (Science Supplement 95,8, June 26, 1942. A. J. P.)

HEREDITY IN PIG IRON

Crystalline Biology

From the researches of I. Iitaka, K. Suzuki and E. Shinohara of the Japanese Institute of Physical Chemistry Research, it has been found that Honkeiko low phosphorus pig iron has a heterogeneous structure which persists in all cast iron made from this pig. This structure is not appreciably altered by repeated remelting, by increase in silica or phosphorus, by high temperature melting nor by mixing with less than 50% of homogeneous pig iron. (Bull.Inst. Phys. Chem. Res. Japan 20, 285-91, 1941, thru Brit. Chem. & Phys. Abstracts. B 1, p. 93, Feb. 1942. A.J.P.)

From a study of microscopic cells exhibiting ameboid movement, intracellular streaming, fission and other activities analogous to those of living tissues parallel with phenomena of life on the protozoan level, in cells being produced by the action of olive oil, gasoline and caustic soda or from ammonium thiocyanate and formalin, A. L. Herrera of the Laboratory of Plasmogeny in Mexico City has arrived at the conclusion that the emanations from volcanoes, sulfurous, cyanic and ammoniacal, have produced and continue to produce microorganisms, by chemical synthesis. (Science 96,14, July 10, 1942. A. J. P.)

WEATHER CYCLES AND PHILOSOPHY

Editorial Review

Before his transfer to what he calls "the realism of the WPB", Mr. Louis Bean, Head Agricultural Economist of the Bureau of Agricultural Economics, was able to complete a solid study of Crops Yields and Weather, now published by the Government Printing Office and sent us by the author for our library. The book consists of 131 half-folio pages of maps and tables giving precipitation by states 1886-1939 in shaded maps, departure from normals in per cent, crops yields per acre, with an introduction by the compiler.

Mr. Bean remarks: "...long-range weather and crop forecasting from season to season would be closer reality if meteorologists could explain certain patterns in weather and crop changes that tend to be repeated from one year to the next or from one decade to the next as phenomena outside the realm of chance. If such explanations were available weather and crops could be forecast about a year in advance and possibly even ten years in advance." "There are patterns in weather fluctuations that embrace several years at regular or irregular intervals... ..a pattern may show up at random at any point in the record." Sometimes inverse patterns occur, month by month, in the second year and positive (not inverse) instances of the same pattern ten years later. "Not mere chance" is the natural phrase in the face of these facts.

We believe, however, that meteorologists are not the only persons upon whom it will be necessary to draw before all this class of phenomena is transferred from the realm of chance to the realm of order. The whole area of knowledge has to submit to treatment in terms such that static symmetry and kinetic harmony become the rule in general and the dominion of chaos the exception. In short, for jobs like this the departments involved require serious philosophical help. Upon an earth conceived as just an oblate sphere resulting from mechanical forces, upon which random continents of irregular shape and meaningless contents of rock and soil occur, together with a play of energy in which ordered cyclism is taken to be the exception ---upon an earth so regarded progress in transferring thought about weather and crops from the area of chance to the domain of order will be slow. Upon an earth conceived as a subtle variation of a tetrahedral symmetry (suggested by Lothian Green) or a related octahedron (suggested by H. Gulick), controlled by acknowledged forces of harmonic motion described by Kepler and others, spaced out from the sun as part of an orderly sequence first described by Bode and in an elegant manner later by J. Miller---upon an earth so conceived there would be room for weather by order as against weather by chance.

There are of course a few philosophers in Washington departments. In fact we cited in MAIN CURRENTS for June 1942, M. L. Wilson of the Dept. of Agriculture itself, who conducted a school of philosophy for some employees of the department. So room has been made, but the question arises, what kind of philosophy has lodgment there? The revolution in over-all thought since 1905, and especially 1917 has brought into play remarkable and important concepts, sufficiently controlled by mathematics to be subject to realistic treatment. And in June last a critical paper linking electricity (hence sun-spot cycles) with matter itself appeared, the start of a new chapter in this mathematical philosophy of our day. Therefore Mr. Bean's appeal, though addressed perforce to too small a group of thinkers, meteorologists,

is more than timely, just as his admirable study---to which we hope to return later---is solid and helpful. F. K.

CROP YIELDS AND WEATHER, Louis Bean, Misc. Pub. No. 471, Government Printing Office, February 1942, 131 pages, 40¢.

THE HISTORY OF AIR AND OF LIVING ORGANISMS

Creature and Environment

The balance of the cycle of CO_2 and O_2 in nature is described by Alfred Romwalter. The concentration of these gases in the atmosphere is connected with the metabolism of living races. The amount of oxygen in the atmosphere during geological times seems to be shown best by a curve having a maximum in present times and a minimum in the Cambrian. Between the limit values 0 and 21 vol. % there is at least one inflection point. The huge insects of the Carboniferous period could live only in air rich in oxygen. The inflection point can possibly be located in the middle of the Ordovician. The CO_2 content of air probably decreased from the end of the Silurian to the Recent era rapidly from 1.0 to 0.03% within 200 million years and this naturally caused many alterations in the development of biological races. (Math. naturw. Anz. ungar. Akad. Wiss. 60, 145-61, 1941, through Chemical Abstracts 36, 2871, May 20, 1942. A. J. P.)